

EUROPEAN RESEARCH ON CABIN SAFETY

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INTRODUCTION

Current aviation safety initiatives such as the JAA Safety Strategy Initiative (JSSI), Civil Aviation Safety Strategy Team (CASST) and the Safer Skies programme are focused primarily at the prevention of aircraft accidents. Indeed this is the prime objective of all of us involved in Civil Aviation and it is right that a major share of aviation safety research should be aimed at accident prevention.

However let us be pragmatic. We will never eliminate all accidents. It is therefore incumbent on us to take all “reasonable” steps to protect passengers in the event of a “survivable” accident. The definitions of “reasonable” and “survivable” could be the topic of a symposium as large as this one but you all know what I mean.

THE EUROPEAN SCENE AND THE JAA

Within the JAA there are a series of specialist Committees and Groups which are responsible for dealing with the various functions of the JAA and whose membership is drawn from the National Authorities and, normally, the Industry. Research is overseen by the JAA Research Committee which draws its membership from the National Authorities of the UK, France, Italy Spain, the Netherlands and Sweden. The Secretariat is provided by JAA Headquarters and we also have members from the European Commission to provide links with their research programme and from Eurocontrol in anticipation of the need to provide end to end certification of advanced Air Traffic Management Systems. The JAA has no research budget and therefore the JAA Research Committee can only co-ordinate research and persuade the National Authorities and the European Commission to carry out work in areas that the Committee has identified as being necessary. To aid in this task a number of Project Advisory Groups have been formed and the PAG on Occupant Survivability has played a major part in organising this conference.

Later this morning Stephane Deharvengt, Chairman of the Occupant Survivability Project Advisory Group, will allude to a large number of topics which are the subject of current or future European Research but I would like to comment briefly on some of these topics.

Cabin Evacuation - however well passengers are protected from impact forces the outbreak of fire is a threat which is always there. Indeed fire can be a threat when there has been no impact as was seen in the accident in Manchester in 1985 when the aircraft caught fire before leaving the ground. The main protection against fire, if it occurs, is a rapid evacuation of the cabin and there is considerable activity in Europe in this area. In addition to extensive practical trials with a cabin mock up a sophisticated computer model has been developed to simulate the effects of fire on an evacuation. The model takes into account a large number of variables and will be validated by

comparing its output with observed data from certification trials, experimental work with real subjects and accident reports..

Fuselage Burnthrough - Should an external fire penetrate the fuselage then there is a real threat to the lives of the occupants. We need to take steps to harden the fuselage against external fires thus giving more time for evacuation. We are actively researching how this enhanced protection can be provided.

Seat Floor attachment - There is no point in designing seats which can withstand a given deceleration if the seat itself becomes detached from the floor during the impact throwing its occupant against the cabin structure with a force beyond human tolerance. The seats need to remain attached to the floor to provide adequate protection both to survive the impact and to avoid sustaining injuries that render the occupant unable to reach the exit.

Water-sprays The safety benefits of water sprays have been demonstrated in the past but the associated costs were considered to be too high given the potential number of lives saved. The gradual withdrawal, for environmental reasons, of halon as a fire suppressant in cargo compartments has driven the industry to look for alternatives. The European Commission has sponsored a project called FIREDASS to investigate the potential use of water sprays as an alternative suppressant. If this concept is proved to be feasible for cargo compartments then the extra costs, in terms of installation and carriage, to extend the system into the passenger cabin would be small compared with the costs calculated for a retrofit to the cabin only.

This may be the first time that some of you have learnt of all this work in Europe. However be assured that it is well known to the US, Canadian and Japanese members of the International Cabin Safety Technical Group and we in Europe are aware of most of what is happening in the US, Canada and Japan. The benefits of International Co-operation are self evident to us both in terms of sharing knowledge and avoiding us all trying to do the same work. We want to continue this co-operation but in order to do so we need, through conferences like this one, to tell the aviation community what we are doing and get feedback.

DRIVERS FOR RESEARCH

In Europe the main drivers for cabin safety research have been

- New Aircraft Designs
- The JSSI
- Past Accidents and Public Perception

More recently there has been a move towards prioritisation of work in order to obtain maximum safety benefit from limited resources.

NEW AIRCRAFT DESIGNS

Here I am thinking primarily of novel cabin configurations and the use of new materials and systems relevant to cabin safety. New safety concepts are constantly being developed but it is difficult for many of them to be retro-fitted to current types. The introduction of a new type of aircraft gives an opportunity to introduce these new features in the design. The advent of the Very Large Transport Aircraft has raised several issues of this nature and a these were reviewed at a conference in the Netherlands in October 1998. These issues include

- Treatment of two or more decks as independent for evacuation purposes
- Relevance of the 90 second test
- Role of Computer Modelling in design and certification
- Interaction of fire and smoke between decks
- Use of water sprays
- Management of Evacuations (outside view, intra and inter deck co-ordination)

It is necessary at the outset for the regulators, if necessary, to formulate new requirements and for manufacturers to consider incorporating new designs into the aircraft. This is essentially a quasi-parallel process but with the regulator taking the lead to ensure a level playing field.

JAA SAFETY STRATEGY INITIATIVE (JSSI)

As part of its plans to maintain or reduce the fatal accident rate per annum in the face of rising traffic levels the JAA has developed this initiative for continuous safety improvement. The JSSI will be developed the light of similar initiatives in other authorities such as CASST. Occupant Survivability and Safety is one of the six key topics identified for action within the JSSI. The initiative is still in the process of development and any work over and above that described here and in Stephane Deharvenght's presentation is yet to be defined.

PAST ACCIDENTS AND PUBLIC PERCEPTION

In Europe these two issues generate significant interest and comment both from the media and from some single issue groups. They can also and elicit some political pressure from Government. Media pressure, although sometimes diverting us from the real issues, is also of more limited effect and tends to be dependent on the news value at the time of the issue compared with others. Some single interest groups have their own agendas which sometimes are not solely aimed at promoting flight safety.

There are occasions where an individual country is, alone, subject to these sorts of pressures on one single issue.. In order to co-operate in research, or any other activity,

we must understand these different political and social pressures within other countries. Through the activities of the International Cabin Safety Technical Group, these different perspectives are recognised by all and this understanding of each other's constraints is vital in achieving a degree of international accord which will, hopefully, produce harmonised regulations.

PRIORITISATION

Demands for research arise for a variety of reasons and from a multitude of sources. Often the decision whether or not to conduct a piece of research is based upon individual preferences, political or media pressure or a subjective belief in its merits. In Europe we have developed a method of estimating the life saving potential of all the various safety improvements and ranking them. In this way the finite resources available to us can be applied in the most beneficial way. This ranking technique is being used by the International Cabin Safety Research Technical Group to give guidance to those driving research programmes. Graham Greene and Ray Cherry will tell you more about these techniques later on this morning.

CONCLUDING REMARKS

I hope that all of you will find this conference useful and I should like to place on record the appreciation of the JAA of the efforts that have gone into its organisation .

Remember that we want it to be a two way exchange of views. Aviation regulation is a two way affair unlike some other industries. We all have the same final goal - a safe and successful industry.

Thank you